(167)

Ed Krupe

SITE SELECTION AND CERTIFICATION

SITE SELECTION AND CERTIFICATION

PREPARED BY

SUBCOMMITTEE No. 1 - NETWORK SITE CRITERIA AND STANDARDS -

OF THE

TECHNICAL COMMITTEE

NATIONAL ATMOSPHERIC DEPOSITION PROGRAM

For additional information please contact: J. H. Gibson
Program Development Coordinator
Natural Resource Ecology Laboratory
Colorado State University
Fort Collins, CO 80523

Site Selection and Certification

1. INTRODUCTION

A change in the chemical composition of precipitation is a good indicator of changes in atmospheric composition since precipitation is a very good scavenging agent of many atmospheric substances (both solid and gaseous). The nutrient status, growth, and development of plants on land and in surface waters are influenced by the availability of beneficial nutrient elements and the deposition of injurious substances dispersed in the atmosphere. Similarly, the health and reproductive capacity of domestic and wild animals, and fish populations are influenced by atmospheric constituents.

Previously, it was believed that most nutrient elements essential for the growth of plants were obtained after release from decomposing organic matter, weathering of soil minerals, or addition as fertilizers. It is now recognized that substances deposited in precipitation, and as dry particulate matter and aerosols significantly augment the supply of both essential elements and potentially injurious substances.

Since the amount of substances dispersed in the atmosphere and deposited in precipitation, particulate matter, and aerosols is projected to increase, there is an increasing need for careful measurement of the amounts, nature, and biological effects of these substances. Such measurements are essential for responsible management of the agricultural, forest lands, and aquatic ecosystems of the United States and Canada. A total of approximately 40

precipitation collection sites are planned to be established in the U.S., primarily in the eastern two-thirds of the nation, to provide observational data for topical research on precipitation chemistry.

2. SITE SELECTION

The collection sites for the Network will be selected to give accurate and representative information concerning the temporal and spatial variation of precipitation and dry particulate deposition of important chemical constituents. The location of individual sites will be chosen to represent major physiographic regions and major agricultural, aquatic, and forested areas within each cooperating state and region. It is important that local sources not bias a sample by locating it next to a point or line source of contamination not representative of the region. However, if a region is typified by a certain type of agricultural land use or is in a heavily industrialized region, the sampler should be located within this region to provide representation of such extensive pollution sources.

The sampler should be sited to conform as nearly as possible with the following criteria:

1. No moving sources of pollution, such as routine air, ground, or water traffic shall be within 100 meters of the site.
2. No surface storage of agricultural products, fuels, or other foreign materials shall be within 100 meters of the site.
3. No continuous sources of pollution shall be within 50 kilometers in the direction of the mean wind direction for the site, and 30 kilometers in all other directions.
4. Sampler shall be installed over undisturbed land, preferably grass covered with no objects within 5 meters of the sampler.

5. No object shall project onto the sampler with an angle greater than 30° from the horizontal. Give particular attention to overhead wires.

It may not be possible to meet all of the above criteria at individual sites. The questionnaire which is described in the following paragraphs will clarify the degree of departure from the desired site requirements.

2.1 Site Description Questionnaire

A site Description Questionnaire covering the important points to consider for either selecting a new site or evaluating an existing one has been formulated and attached. The following paragraphs discuss each topic covered in the questionnaire. All measurements should be reported in the metric system and directions in degrees from north or 16 points of the compass. Throughout the questionnaire when a distance is requested the distance from the collector should be inserted. If additional space is needed for extended remarks concerning local problems, please attach additional pages. This form should be completed for each active or potential site and returned to the NC-141 Director as soon as possible.

2.1.1 A. Site Identification

The station name should be descriptive and unique. Numbers for each site will be assigned later. The elevation should be that of a specific object at the site. The needs for the requested information are obvious. The mailing address should be clear to facilitate information and data transfer between the project administration, central analytical laboratory, and the field observing participants.

2.1.2 B. Logistics

These questions are very important for the continued operation of a quality site. While not necessary, it is also desirable to provide a simple hand drawn map showing the relative location of the site to roadways and the nearest electricity transmission lines.

2.1.3 C. Equipment on Hand

The raingage is strongly recommended to provide concurrent measurement of precipitation. Specifically, the recording raingage allows the added feature of determining precipitation rates needed to interpret the deposition observations. Similarly, a wind recorder will allow correlation between observed precipitation chemistry and wind speed and direction. The pH and conductivity meters are essential for preliminary assessment of the sample chemical quality.

2.1.4 D. Background Data

The climatology of the area, as interpreted for the local site, will be useful to ascertain the regional representativeness of the location. As records are accumulated, the site climatology will be continuously updated and compared with nearby long-term records to detect anomalous behavior.

2.1.5 E. Topography

Careful evaluation of these items will determine the sampling quality of the site. The surface grade should be reported in percent positive upward and negative downward in various directions from the sampler site. If available, soil analyses close to the site will be useful to characterize the site environment. The description of physical objects in proximity to the site will permit evaluation of potential sample contamination for wind-blown precipitation.

2.1.6 F. Civilization

The questions are designed to differentiate between ground, air, and water moving sources. Stationary source locations are required to ascertain their potential influence on precipitation quality. Unusual or intermittent sources such as quarry operations, stockpiles of coal, farm wastes, and similar materials should be recognized as potential sources of contamination under high wind conditions.

3. GENERAL SITE REQUIREMENTS

The sites will be evaluated on the basis of available knowledge of wind trajectories, sources of substances in the atmosphere, prevalent forms of deposition, frequency of precipitation events (rain, snow, hail, and dust storms), and other meteorological and atmospheric processes that influence the deposition of substances in each state or region. Of critical importance at the local scale is the proximity of the collector to obstacles (disturbances to airflow around the collector opening) and consideration of land-development in future years. Since it is many times not possible to predict future land-use change, consideration should be given to alternate sites in the event that the original selection is no longer representative of the region. The collection stations should be sited, whenever possible, in the proximity to locations where research on either water resources, management, quality, or distribution is ongoing. Such judicuous placement of collectors will allow additional use of the Network data by those with a direct need for the information.

3.1 Site C'assification and Certification

Each site will be initially classified and certified as promptly as possible, based upon the information in the questionnaire and, if necessary, a site visit. A final certification will be made after a year or more of routine operation of each site.

Classification will be at four levels:

Class A

1. Required wet/dry collector and weighing rain gauge on site.
2. Acceptable pH and conductivity instruments on site.
3. All logistical, topographical and local source criteria are satisfactory.
4. Recording wind speed and direction instruments on site.

Class B

The same as Class A, but lacking wind instruments.

Class C

The same as Class A, but unsatisfactory (or uncertain) of logistical, topographical or local source criteria.

Class D

The same as Class A, but lacking wind instruments and also unsatisfactory (or uncertain) of logistical, topographical or local source criteria.

4. FIELD OBSERVER INSTRUCTIONS

A manual is provided for each observer to establish uniform procedures for sample handling and reporting. It is anticipated that revisions will be necessitated by field experience and will be issued periodically. The Instructions are prepared in such a way that numbered revisions can be easily inserted to keep the manual current at all times.

EXAMPLE

NC-141 SITE DESCRIPTION QUESTIONNAIRE

U. S. Dept. of Energy - Environmental Measurements Lab
Agency, Organization or Institution

A. SITE IDENTIFICATION

1. Station *Chester* 2. County *Morris* 3. State *N.J.*

4. Latitude *40* ° *47* ' 5. Longitude *74* ° *40* ' 6. Elevation *262* (m)

7. Name of Supervisory Official *Dr. Herber L. Volchok*

Alternate *Mr. Donald Freeswick*

8. Mailing Address *376 Hudson St.,* *New York,* *NY* *10014*
(number -- street) *(city -- state)* *(zip code)*

9. Phone *212* / *620-3619, 3607* / *1660 -- 3619, 3607*
(commercial) *(FTS)*

B. LOGISTICS

1. Is road access to proposed site in summer: *X* Good, ____ Fair, ____ Poor
and winter: ____ Good, *X* Fair, ____ Poor

2. Type of road surface? *Dirt - gravel with tar filler*

3. How far from the road will collector be sited? *90* (

4. How close can a vehicle approach the collector? *90* (

5. What electrical power is available on site? *120/240* (Volts) *200* (A

If none, how soon will it be provided? *N/A*
(date)

6. Is there adequate security against vandalism, etc? *X* (Yes) ____ (

7. Are there any special logistical problems? Please describe: *None*

C. EQUIPMENT ON HAND

1. Raingage: None _____ Recording X Non-Recording _____
Weighing X Tipping Bucket _____ Other _____
Opening 20.3 (cm) Manufacturer Belfort Model 5-780

Distance 2.4 (m)

2. Wind: None _____ Speed X Direction X Distance 15 (m

Recording X Non-Recording _____ Manufacturer Weathermeasure

Model Skyvane II Height above ground 10 (m)

3. pH Meter: None _____ Manufacturer Orion Model 801

4. Conductivity Meter: None _____ Manufacturer Barnstead

Model PM-70CB

5. Available Lab Space: None _____ Good X Fair _____ Poor _____

Distance 60 (km)

6. Other related equipment (please list): Temperature, dewpoint, pressure, nephelometry and various air pollutant sensors.

D. BACKGROUND DATA

1. Precipitation at the site:

Yes X Years 1½ yr Annual Precipitation 1308 mm

No _____ Nearest gage _____ (km) Years _____

Annual rain _____ (mm) Annual snow _____ (cm)

2. Wind at site: Yes X No _____ Years 1½ Distance to nearest measurement _____ (km)
(Please attach wind rose if available.)

3. If air quality or precipitation chemistry data available at or near the site please describe:

Air -- NO_x, SO_x, visibility, mass, solar radiation, ozone & radiation.

Precip - trace metals, major anions & cations, & radioactivity.

E. TOPOGRAPHY

1. Ground slope at site: Direction from sampler SE Amount +/- -12 %

2. Soil type: within 10 m of site ? , within 1 km ?

% Cultivated _____, % Orchard _____, % Lawn _____

% Pasture 100, % Forest _____, % Other _____

within 1/4 section containing site.

(Please attach standard soil analysis if available.)

3. Tall objects in area:

A. Trees Oak, elm, maple, apple (Species) Max. Height 10 (m)

Distance 80 (m) Direction S

B. Buildings Trailer (Type) Height 3.5 (m)

Use: Instrumentation Distance 10 Direction SE

C. Other (eg overhead wires, masts, etc.)

(1) Object Meteor tower, Height 10 (m)

Direction N, Distance 8 (m)

(2) Object Telephone pole, Height 12 (m)

Direction SW, Distance 25 (m)

(3) Object _____, Height _____ (m)

Direction _____, Distance _____ (m)

F. CIVILIZATION

1. Large highways (expressways): Distance 8 (km, m) Route # 10
   Direction from sampler NE.
2. Other paved roads: Distance 175 (km, m) Direction from sampler NW
   traffic: Heavy _____, Medium _____, Light X.
3. Unpaved road: Distance 90 (km, m) Direction from sampler SE
   traffic: Heavy _____, Medium _____, Light _____.
4. Parking lot: Distance 1 (km, m) Direction from sampler SW
   Unpaved _____ Surface material Macadam Use: continuous X
   intermittent _____ car volume 20 large truck volume 2
5. Lake/river or rail traffic: Distance ? (km, m) Direction from sampler ____
   barge _____, lake steamer _____, ocean vessels _____, rail _____
   traffic: Heavy _____, Medium _____, Light _____.
6. Airport(s): Distance 5 (km, m) Direction from sampler N
   traffic: Heavy _____, Medium _____, Light X.
7. Stationary sources:
   Power plant(s): Distance Not known (km) Direction from sampler ____ Fuel _____
   Electrical capacity _____ (KW_e, MW_e)
   Light industry: Distance _____ (km) Direction from sampler ____ Product _____
   Heavy industry: Distance _____ (km) Direction from sampler ____ Product _____
8. Other sources: Significant agricultural operations: Distance _____ (km,
   Direction from sampler _____ Other (please describe) Dairy farm
   _____
   Distance 1.1 (km, m) Direction from sampler SW.

G. OTHER

It would be very useful for the Site Selection and Certification Subcommittee to have one or more of the following submitted with the questionnaire.

1. Topographic map, 1:24,000, revision year *1970* not available_____
2. Topographic map, 1:250,000, revision year_____ not available_____
3. Aerial photograph, 1:1200, year_____ not available_____
4. Photos of the site in the 8 directions.

The site and items noted in Section F should be indicated on the figures.

United States Department of Agriculture | Forest Service | Payette National Forest | Krassel Ranger District
P.O. Box 1026
McCall, ID 83638

Reply To: 2320

Date: April 22, 1989

James R. Fazio
Department of Wildland Recreation Management
University of Idaho
Moscow, ID 83843

Dear Mr. Fazio:

We have received your letter requesting the placement of an environmental monitoring station on the National Forest.

The proposal is currently being reviewed by the District and Forest Staff. We will contact you regarding the results of this evaluation.

Sincerely,

for EARL C. KIMBALL
District Ranger

4/27/89

Jim + Holly

(1.) There is going to be a slow-down on this project. FS wants to look at it more closely, according to Ken Pope. I have heard nothing about the actual instrument. What can you tell me, ref. who ordered it, from whom, etc?

(2.) Would you please "reserve" the rooms for Aug 5 + 6 and do a little planning on how we can best host 15-20 people from the FS, O+G + UI for a "forum." Send me meal + overnight costs so I can pass on to F.S. — and anything else I/they should know.

Where Tradition Meets the Future
1889-1989
University of Idaho

June 16, 1989

Office of the Dean

College of Forestry,
Wildlife and Range Sciences
University of Idaho
Moscow, Idaho
83843 U.S.A.

208-885-6441

TEACHING
RESEARCH
SERVICE

Mr. Veto "Sonny" LaSalle, Forest Supervisor
Payette National Forest
P.O. Box 1026
McCall, ID 83638

Dear Sonny:

Thank you for visiting the proposed site for the atmospheric monitoring and meteorological station at Taylor Ranch. It was good to review things on the ground together--you, me, Dr. Dale Bruns of INEL, and Jim and Holly. It's easier to find solutions when we can all see what's involved.

We completed our site analysis and have determined that we will not need to place the station on National Forest land, and therefore will not be seeking a special use permit at this time. We have developed a compromise plan that will locate the monitoring station on University of Idaho property at the edge of the sagebrush bench, rather than in the center of the bench as originally proposed. Air quality experts from Idaho National Engineering Laboratory believe that this is a compromise location, but will be a suitable site for preliminary data collection with the temporary equipment.

The MET station consists of a tripod base with a 12-15 foot pole supporting the sensory equipment. A microcomputer unit which temporarily stores the climatological data will be attached to the structure. The atmospheric monitoring instrument consists of a 24 x 18 x 8 inch metal suitcase containing an air filter and pump which is attached to two portable 18 x 16 inch solar panels. The pump is inaudible when standing more than 4 feet from the instrument. Additional information is attached.

Thanks for making the effort to join the Man and Biosphere team at Taylor Ranch. It was an important event, having the Soviet, Forest Service, Park Service, INEL and UI scientists together talking about the environmental baseline monitoring and assessment potential of the area. We appreciate your support for wilderness research at our Taylor Ranch Wilderness Field Station.

Sincerely,

John C. Hendee

John C. Hendee
Dean

JCH:ead

cc: Dr. Leon Neuenschwander, FWR Associate Dean for Research
Jim and Holly Akenson, Resident Managers--Taylor Ranch
Dr. Dale Bruns, Idaho National Engineering Laboratory
Dr. Jim Fazio, Executive Coordinator--UI Wilderness Research Center
Dr. Oz Garton, Professor of Wildlife

TAYLOR RANCH PORTABLE ATMOSPHERIC MONITORING
AND METEOROLOGICAL (MET) STATION
Site Location Decision--6/9/89

Background:

The University of Idaho, Wilderness Research Center and the Idaho National Engineering Laboratory (INEL) are establishing a long term atmospheric monitoring program at the Taylor Ranch Field Station. Essential to this program is a MET station having multiple factor sensing capability. This station will provide a complete climatological record. Air samples will be filtered and analyzed for heavy metal contamination.

The Taylor Ranch site has been selected because of its location in the middle of the Frank Church, River of No Return Wilderness, a relatively pristine airshed. INEL scientists consider that this area may contain the most pristine inland airshed in the continental United States due to its remoteness and lack of human development and activities in the vicinity. The atmospheric information acquired by this station will be used for comparison with other similar stations around the world, thus contributing to the global atmospheric data base. Information obtained from this station will also be utilized for a wide range of ecological research, conducted through the Wilderness Research Center at Taylor Ranch.

Site Selection:

After a reconnaissance of potential site locations, INEL and UI scientists identified a site on UI property at the edge of an elevated bench in lower Rush Creek near its entry to Big Creek as being best suited for the MET station. This sagebrush covered flat adjoins the UI Taylor Ranch property above Rush Creek. The optimal positioning of the MET station would be in the middle of the flat, approximately 150 feet from the property boundary, on

Payette National Forest land, but to avoid the need for a special permit, for the immediate pilot study at least, a compromise location on the edge of the sagebrush flat on UI property was selected. The site was visited 5/30/89 by Forest Supervisor Sonny LaSalle, Dean John Hendee of UI College of FWR, Dr. Dale Bruns of Idaho National Engineering Laboratory and Jim and Holly Akenson, resident managers of Taylor Ranch Wilderness Field Station.

Placing the facility at the selected site will create limited visual impact to wilderness visitors. The site is completely screened from view of the Big Creek Trail by both vegetation and topography. It may be possible to see the site from a short section of the Rush Point Trail, depending on the strategic use of trees and brush to screen the equipment. Visual effects would be insignificant as this trail receives minimal use and the station is over one-half a mile away from the Rush Point Trail at the nearest segment.

Portable MET Station Description:

The MET station consists of a tripod base with a 12-15 foot pole supporting the sensory equipment. A microcomputer unit which temporarily stores the climatological data will be attached to the structure. The atmospheric monitoring instrument consists of a 24 x 18 x 8 inch metal suitcase containing an air filter and pump which is attached to two portable 18 x 18 inch solar panels. The pump is inaudible when standing more than 4 feet from the instrument. An unobtrusive fence will be placed around the station to protect the sensitive apparatus from disturbance by wild animals. About a 15 x 15 foot area needs to be protected.

Letter to John Hendee May 31, 1989

- Appreciated discussion of TR future & J&H future career goals
- Enclosed draft letter to Sonny LaSalle about MET station site change to TR property.
- Enclosed copy's of Hendee letter 5/20 on site proposal, plus MET station info sent to Payette NF in mid May.
- Returned yellow notepad left after Soviet Conf.
- Successful Soviet/INEL/UofI trip. Strengthen ties. Multiple method monitoring (Soviet, USPS, FS...) → standardized global techniques

Holly

Mr. Vito "Sonny" LaSalle, Forest Supervisor
Payette National Forest
P.O. Box 1026
Mc Call, ID 83638

Dear Sonny:

Thank you for visiting the proposed site for the atmospheric monitoring and meteorological station at Taylor Ranch. We have done a site analysis and have determined that we will not need to place the station on Forest Service land, and therefore will not be seeking a special use permit at this time. We have developed a compromise plan for locating the monitoring station on University of Idaho property at the edge of the sagebrush bench, rather than on the center of the sagebrush bench. Air quality experts from Idaho National Engineering Laboratory believe that this is a compromise location, but will be a suitable site for preliminary data collection.

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We are glad you were able to visit the proposed monitoring site area with Dr. Dale Bruns of INEL. We look forward to working with you on projects and issues of wilderness management.

Sincerely,

Draft sent to John Hendee

TAYLOR RANCH PORTABLE ATMOSPHERIC MONITORING AND METEOROLOGICAL (MET) STATION

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The Taylor Ranch site has been selected because of its location in the middle of the Frank Church, River of No Return Wilderness, a relatively pristine airshed. INEL scientists consider that this area may contain the most pristine inland airshed in the continental United States due to its remoteness and lack of human development and activities in the vicinity. The atmospheric information acquired by this station will be used in comparison with other similar stations around the world, thus contributing to the global atmospheric data base. Information obtained from this station will also be utilized for a wide range of ecological research, conducted through the Wilderness Research Center at Taylor Ranch.

Site Selection:

After a reconnaissance of potential site locations, Idaho National Engineering Laboratory scientists identified an elevated bench in lower Rush Creek as being best suited for the MET station. This sagebrush covered flat lies immediately east of an extension of Taylor Ranch property up Rush Creek (see map). The optimal positioning of the MET station would be in the middle of the flat, approximately 180 feet from the property boundary, on Payette National Forest land, Krassel Ranger District.

Placing the facility at the desired site will create limited visual impact to wilderness visitors in the area. The site is completely screened from view of the Big Creek Trail by both vegetation and topography. It is possible to see the site from a short section of the Rush Point Trail. This effect would be insignificant, as this trail receives minimal use in comparison to the main trail, and the station is over one-half mile away from the Rush Point Trail at the nearest segment.

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Cooperative Agreement between University of Idaho, INEL, and Payette National Forest

The MET station will provide a valuable data base for U of I and INEL, plus this information will be available to the Forest Service upon request. The Wilderness Research Center has participated with the Payette National Forest in several cooperative activities and programs. The use of this site for atmospheric monitoring, through a cooperative agreement between the Payette National Forest and the University of Idaho will establish yet another arrangement of mutual benefit.

INSTRUCTIONS FOR LABELLING SAMPLES

2 4 6
FC789A01LICH
1 3 5

We code the samples before we send them to the laboratory for analysis. These codes are divided into six sections:

1. The first two letters are a code for the location where the sample was taken. In your case, FC stands for Frank Church River of No Return Wilderness. (We used that instead of TR because it might get confused with two of our other sites, Twin Creeks and Torres del Paine.)

2. The third character is the month the samples were collected. In this case, 7 is for July. Since October, November, and December have two numbers, we use letters to designate these months; we use X for October, Y for November, and Z for December.

3. These two numbers are the last two numbers in the year the samples were collected.

4. This letter is the site designation at the location. When there is only one site at a given location, we use the letter A.

5. The next two numbers are the sample numbers. For vegetation samples, like litter, moss and lichens, there are usually ten samples.

6. The last four characters are a four letter abbreviation for the type of sample that has been collected. MOSS is moss, LITT is litter, LICH is lichen, SOIL is for soil, UNFL is unfiltered water, and FILT is filtered water.

United States Department of Agriculture | Forest Service | WO

Copy to M. Scott
Fazio
Krumpe
Akensons
File for meeting in Boise Jan 18

Reply to: 4060 (TMR)

Date: DEC 15 1989

Subject: Current Status of MAB's Biosphere Reserve Program

To: Regional Foresters, Station Directors, and Area Director

In the last few months at several meetings, questions were raised concerning the Forest Service's role in the Biosphere Reserve Program. I thought it would be useful to provide you and your staffs a briefing on this program since there are a number of different Biosphere Reserve activities underway in the Regions.

The U.S. network of Biosphere Reserves is part of the United Nations Educational, Scientific, and Cultural Organization's (UNESCO's) Man and the Biosphere (MAB) Program in which 113 nations presently participate. The network currently comprises 266 sites in 70 nations with 45 sites in the United States. Of these, 15 include Forest Service administered lands.

Let me summarize what I consider to be the essential elements of a Biosphere Reserve. A Biosphere Reserve is a unique category of protected/managed areas which has been identified to provide information about and solutions to management issues. In the U.S. network, it combines both conservation and the sustainable use of natural resources and related activities. These are also part of a worldwide information-sharing network. Some of the characteristics of a Biosphere Reserve are:

1. Biosphere Reserves represent examples of characteristic ecosystems of one of the nation's natural regions.

2. It is a land or coastal/marine area in which people and uses are integral components, and which is managed for objectives ranging from complete protection to intensive, sustainable production.

3. It is a regional center for monitoring, research, education, and training in natural and managed ecosystems.

4. It is a location where scientists, government managers, and local populations can cooperate in developing programs for managing land, water, wildlife, and other natural resources to meet human needs.

5. It provides a means for resolving conflicts among managers and users over natural resources.

6. Each Biosphere Reserve is a symbol of the voluntary cooperation to conserve and use natural resources for a region's general well-being.

Subparagraph 6 above encompasses one of the unique features of the Biosphere Reserve Program. There are no administrative restrictions or legal obligations associated with the program since multifunctional development depends on the voluntary participation of site administrators. Formulation of policies and programs for a given Biosphere Reserve is the sole prerogative of the site's administrator.

The Forest Service first joined MAB in 1971 and, with the National Park Service, has played a leadership role in both the MAB and the Biosphere Reserve Programs. In fact, Forest Service scientists assisted in developing the current Biosphere Reserve structure. Many of the original Biosphere Reserve sites established in 1974 were and are Forest Service administered lands. Today, a number of Forest Service scientists and managers are studying the possibility of adding to the system. Forest Service and university scientists as well as others are working together on various investigations which are contributing to the understanding of natural resource issues directly related to the concerns of Forest Service managers through the use of the Reserves.

Since 1971, procedures have been developed for the identification, evaluation, nomination, and approval of new Biosphere Reserves. The original guidelines were published in 1983 and are now under revision. Basically, a joint panel of natural resource managers and scientists convene to evaluate given sites against a set of criteria. Their report and recommendations are reviewed by a national panel and, if approved, the nomination is submitted to MAB's International Coordinating Council in Paris.

The Forest Service has always had an official representative to MAB. Since 1972, the Forest Service has also had an official representative in the Biosphere Reserve Program. As the Director of Timber Management Research, I represent the Forest Service in the Biosphere Reserve Program.

This brief summary is provided to answer questions raised by the field. There appears to be some confusion as to the role of the Forest Service in this program and its value to the Agency. It should be noted that the Forest Service has been and is a major support of the MAB Program.

This letter should be shared with appropriate members of your staffs. I will be happy to answer any questions on Biosphere Reserves and the MAB Program. I can be reached at FTS 235-8200, commercial 703/235-8200, or at either of the following two Data General addresses: TMR:WO1A or S.KRUGMAN:WO1A.

STANLEY L. KRUGMAN, Director
Timber Management Research

cc:
WO Staff

I concur:d.parker:89-12-13

SLKrugman/dpp

EXTERNAL FILTER/PUMP—ATTACHMENT INSTRUCTIONS

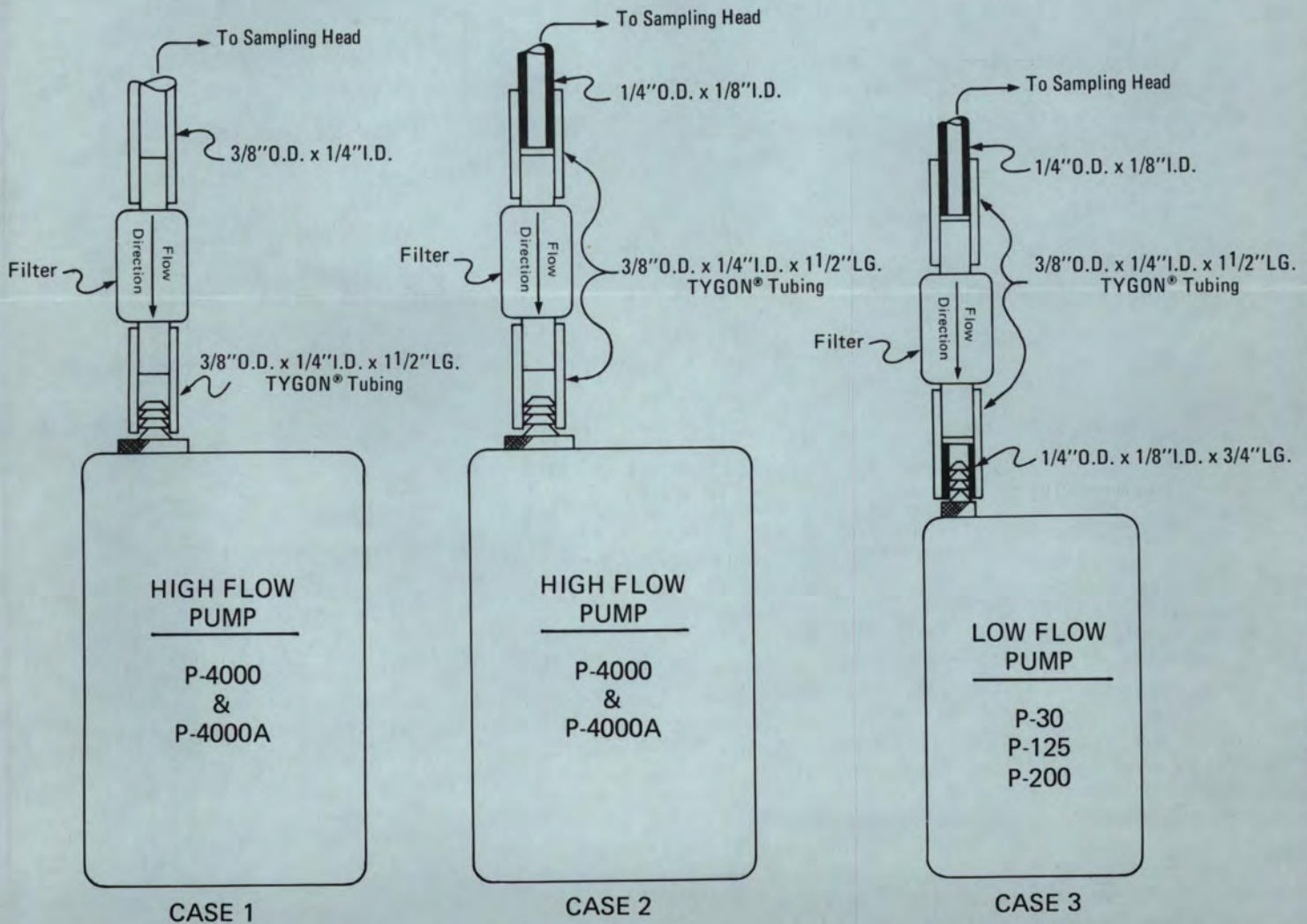
Your Du Pont sampler will provide you with constant flow, ±5%, over its design range. In order to assure uninterrupted performance, we recommend you use the small filter included with the pump.

The filter will usually last about a year before replacement is required. However, under dusty conditions, more frequent replacement will be necessary. Replace the filter immediately when:

- Liquid from an impinger is noticed in the filter.
- The pump is not able to maintain flow for 8 hours at its designed flow rate.
- The pressure drop across the filter exceeds 8" water column.

Using appropriate lengths of tubing supplied, attach the filter to the pump as shown in the illustration below. Note – orient the filter so the air flow is in the direction indicated by the arrow on the filter housing.

When ordering replacement external filters from Du Pont, indicate Part Number P101.

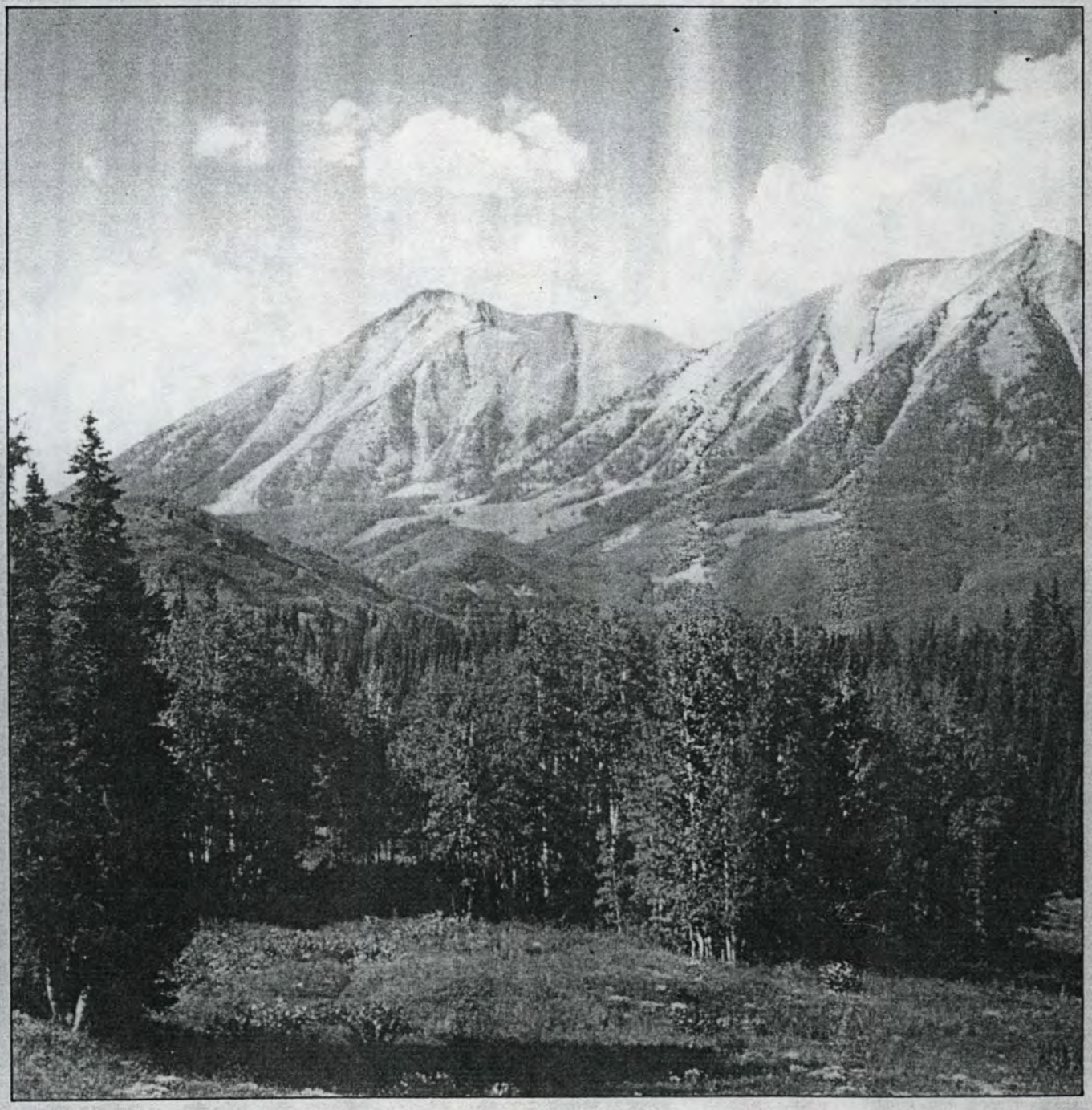


United States
Department of
Agriculture

Forest Service

Forestry Research West

October 1989



A report for land managers on recent developments in forestry research at the four western Experiment Stations of the Forest Service, U.S. Department of Agriculture.

Forestry Research West

In This Issue

Cover

Clean air is just one of the many attributes wilderness areas offer. Scientists at the Rocky Mountain Station have developed a new procedure to help land managers evaluate air pollution effects on Class I wildernesses. Details begin on page 1

To Order Publications

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To change address, notify the magazine as early as possible. Send mailing label from this magazine and new address. Don't forget to include your Zip Code.

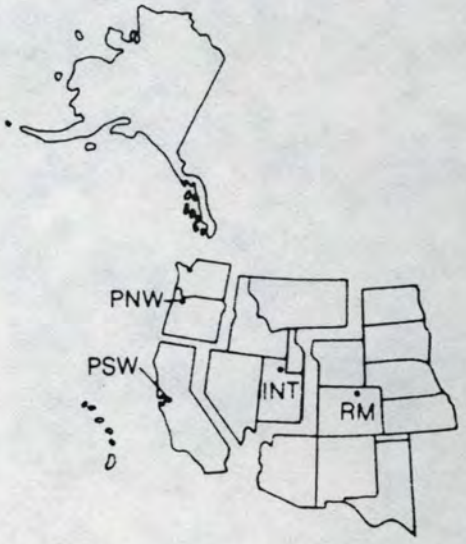
Western Forest Experiment Stations

Pacific Northwest Research Station (PNW)
P.O. Box 3890
Portland, Oregon 97208

Pacific Southwest Research Station (PSW)
P.O. Box 245
Berkeley, California 94701

Intermountain Research Station (INT)
324 25th Street
Ogden, Utah 84401

Rocky Mountain Forest and Range Experiment Station (RM)
240 West Prospect Street
Fort Collins, Colorado 80526-2098



Screening air quality in Class I areas

Most wilderness visitors expect clean air—

but it's not always a guarantee.

President Bush, declaring that "too many Americans breathe dirty air", announced in June a $14 to $19 billion per year plan for beefing up the Clean Air Act and sharply reducing acid rain pollution.

Among the proposals called for are requirements for factories and plants emitting toxic air pollutants to use the best technology available to reduce overall emissions by 75 to 90 percent, cutting sulfur dioxide emissions by 10 million tons per year, and nitrogen oxide emissions by 2 million tons.

The President's annoucement is coupled with, and a reflection of, national, and even world-wide concern about global warming, the greenhouse effect, acid rain, and other air pollution-related issues.

Along with the urgent need to reduce pollutants, there is an equally pressing need to protect those areas that are still clothed in clean air. Some of our Nation's most pristine skies are in wildernesses and National Parks. Here, Federal land managers are required by the Wilderness Act of 1964 and the Clean Air Act (CAA) of 1970 to preserve the natural conditions of these areas—that includes managing for clean air.

The Clean Air Act includes a program for prevention of significant deterioration of air quality—generally referred to as "PSD". This PSD program is designed to prevent areas currently having clean air from becoming too polluted. Wildernesses and National Parks established before 1977 are designated as Class I areas—allowing only very small increments of new pollution above already existing air pollution levels. Wildernesses established after August 7, 1977 are Class II areas, allowing for larger increments.

Working with PSD's

Specifically, the Forest Service is required by the CAA to report to the Environmental Protection Agency or the State the effects of proposed air pollution from new or modified major emission sources that may affect air-quality-related values (AQRV's) in Class I wildernesses managed by the Forest Service. Managers of Class I areas do this by reviewing applications called Prevention of Significant Deterioration (PSD) permits—a preconstruction review and permitting process for new or expanding sources of pollution. New source permit applicants submit plans to the permitting authority (usually the EPA or State), who examines the proposed location of the facility, it's general design, projected air pollution emissions, and potential impacts. If it appears that projected emissions may impact a Class I area, the EPA or State alerts the Federal land manager, who, in turn, determines the impact of the projected pollution level increases on the Class I area's AQRV's, and recommends approval, denial, or modification of the preconstruction permit.

Though sometimes difficult to obtain, lake assessment data are necessary to effectively implement the screening technique.

Not only is this a very involved process, but land managers often experience a general void of information to help them make these important determinations. Recognizing this need, Forest Service scientists, administrators, and other specialists last year sponsored a workshop designed to help land managers evaluate air pollution effects on Class I areas. The result was a procedure to screen permit applications, to help managers identify those applications that are likely to require more intensive study and consideration. The screening procedure uses estimates of sulfur and nitrogen deposition and ambient ozone concentrations to determine whether adverse effects on AQRV's could occur. In the procedure, these estimates are expressed as "green" and "red" lines on a graph. Pollutant doses less than the green line value might be judged permissible by managers, and the application recommended for approval. Doses above the red line value are likely to cause at least one AQRV to be adversely affected—resulting in a recommendation for denial, unless additional data are provided to prove otherwise. Doses falling between the red and green lines (yellow zone) would be evaluated on the basis of additional information.

Making it work

Land managers need six types of data to effectively implement the screening technique: (1) estimates of current deposition and air concentrations; (2) predicted deposition and air concentrations due to proposed source; (3) an inventory of biological resources associated with the AQRV's of the Class I area; (4) biological data on existing plant and animal species; (5) lake, stream, and soil survey/geological assessment; and (6) snowpack chemistry and hydrologic characteristics of the area. Alot of information, but necessary for an accurate evaluation. Some of this data can be obtained from published sources, local scientists, or university, State, Federal, and individual research personnel. However, wilderness managers will need to monitor their existing conditions to gather much of the information. Guidelines for doing so are available in *Guidelines for Measuring the Physical, Chemical, and Biological Condition of Wilderness Ecosystems*, General Technical Report RM-146, available from the Rocky Mountain Station.

Lake sampling in the Bridger Wilderness. Wyoming.

Report describes procedure

Results from the workshop, describing in detail the development and implementation of this process, have been published in a new report titled *A Screening Procedure to Evaluate Air Pollution Effects on Class I Wilderness Areas*, General Technical Report RM-168. The booklet also contains descriptions of nine wildernesses across the country, and discusses the AQRV's workshop participants attached to these areas, and why. Specific factors and considerations used in developing the process are also covered, including terrestrial and aquatic systems. The Rocky Mountain Station has copies.

The Forest Service's intent to use this screening process and to make it agency policy has been published in the Federal Register, Volume 54, No. 77, page 16382, April 24, 1989.

All Forest Service Regional Offices have been directed to develop screening procedures for each Class I area in their Region by: (1) identifying AQRV's for each Class I area, and (2) organizing workshops to develop specific screening values for sulfur and nitrogen deposition, and ozone concentrations. Most Regions have either conducted or scheduled such workshops. If you would like more information on the workshops, contact James Byrne, Watershed and Air Management Staff, Forest Service-USDA, P.0. Box 96090, Washington, D.C. 20090-6090, (703) 235-8180, FTS 235-8180.

The GLEES study area is nestled in the Medicine Bow National Forest in southern Wyoming.

For more information on the loading effects of sulfur, nitrogen, and ozone on wilderness ecosystems, contact Project Leader Doug Fox, Rocky Mountain Station, 240 W. Prospect Rd, Fort Collins, Colorado 80526, (303) 498-1231, FTS 323-1231.

Research continues

Finally, the Rocky Mountain Station is engaged in a long-term ecosystem-wide research effort to support the speculation and estimation that go into documents like the screening approach. A multidisciplinary team of research scientists has been working for the past three years to establish the Glacier Lakes Ecosystem Experiments Site (GLEES) for such research. GLEES is a high-elevation alpine ecosystem located on the Medicine Bow National Forest, west of Centennial, Wyoming, in the Snowy Range Mountains. The site is instrumented for meteorological, aerometric, deposition, snowmelt, and streamflow measurements as part of a holistic ecosystem research program.

Research into causes and effects, as well as development of models to simulate natural processes at GLEES, will continue to help quantify the estimations contained in the screening report.

Original Records

The State Climatologist has an extensive archive of orginal records. All of the original manuscript forms for the NWS stations from the beginning of record (some back to the 1890's) to the present are available. In addition, there are some United States Army records available, which are previous to the 1890's.

Agencies which have records for which they have no further use, such as fire weather, are encouraged to contact the SC before disposing of them. Also, any person or agency that collects data is encouraged to send the data or to inform the SC so that others may know these data are available.

Other Sources of Information

The State Climatologist has access to numerous other systems, such as the NWS's Climate Analysis Center and the National Climatic Data Center for answering requests. Also, the Western Regional Climate Center (WRCC) at Reno, Nevada assists the State Climatologist and provides direct assistance to those requiring use of lightning data. WRCC also has the Bureau of Land Management and the Forest Service RAWS weather data as well as NWS radiosonde and airways data sets.

A library of out-of-print publications is maintained by the SCS who also has access to libraries maintained by other State Climatologists and federal and state agencies. Thus, requests which cannot be satisfied internally can often be referred to a person or agency knowledgeable in the area or subject in question. Each state surrounding Idaho also has a State Climatologist Program. These people are also a resource that can be contacted for additional information.

Charges for these services are minimal. Many reports can be generated in 15 minutes or less and are not charged. Requests requiring computer time are cost reimbursable. Since many reports now are for data on microcomputer diskettes, a minimal charge of $5.00 is made for material, computer time and mailing. For those agencies which regularly support the operation of the State Climatologist Program through grants or contracts, no charges are assessed.

Cooperating Agencies

National Climate Data Center, NOAA
National Weather Service, Western Region, NOAA
Bureau of Reclamation, USDI
Soil Conservation Service, USDA
Bureau of Land Management, USDI
Forest Service, USDA

For further information on the State Climatologist program or to request assistance with a problem requiring climatic or streamflow data, contact:

Dr. Myron Molnau
State Climatologist
Department of Agricultural Engineering
University of Idaho
Moscow, Idaho 83843
(208) 885-6182

Idaho Water Resources Research Institute

Education Research Extension
College of Agriculture

State Climate Services for Idaho

University of Idaho

Purpose

Climatic information is essential to every citizen of Idaho. Whether these citizens are farmers or recreationists, researchers or corporate executives, engineers or planners, climate plays a key role in planning and every day work.

The State Climatologist Program strives to "...acquire, archive, process and disseminate, in the most cost-effective way possible, all climate and weather information, which is or could be of value to policy and decision makers in the state", and to provide climatic services which are important to the needs of the people of Idaho. Providing these services is the State Climatologist whose functions are to:

- *act as liason between Idaho weather information users and the National Climatic Data Center of the National Oceanic Atmospheric Administration;*
- *maintain a data bank of climatological and hydrological information;*
- *supply data in a useful form to users;*
- *refer requests for complex analyses to the appropriate person, agency or consulting firm;*
- *maintain contact with users of climatic information in order to ascertain their needs for data and analyses;*
- *maintain contact with researchers to convey user's needs to them and keep them appraised of other researcher's work;*
- *maintain a bibliography of publications pertinent to Idaho and Pacific Northwest climate.*

History

The National Weather Service (NWS) State Climatologist Program was terminated in 1973. After this program was dropped, a gap existed in the delivery of data and information from the data collection and publishing agency to the end user. Until this time, requests for data and climatic analyses were handled by the (NWS) State Climatologist (SC) in each state. The SC provided a service to persons in the state that was not available elsewhere. Requests would range from questions about maximum snow accumulation to minimum temperature to drought duration and the like.

In May, 1978, an agreement was concluded among the National Climatic Data Center, the National Weather Service and the University of Idaho to provide some of these terminated services. Since 1978, the State Climatologist Program, in cooperation with the Idaho Water Resources Research Institute and the Idaho Agricultural Experiment Station, has developed and implemented a broad base of services.

Climate Information Services

A few of the requests for data and information services that have been answered in the last few years are:

Snow depth and frozen ground for pipeline design

Rainfall intensities for microwave design

Streamflows for small hydro design

General climate studies for wildlife habitat

Rainfall and snowmelt data for erosion and runoff

Snow and ice on highways for insurance claims

Drought assessment

Snowloads for structural design

Evaporation from sewage lagoons and pesticide wash water holding ponds

Develop a mean annual precipitation map

Minimum temperature probabilities for fruit plantings and concrete curing

Climate Data Services

The data and information necessary to answer requests come from a variety of sources. These sources include computerized databases, published paper records or original manuscript records.

NHIMS

The primary data archive for climatic and water data in Idaho is the Northwest Hydrologic Information Management System (NHIMS). This database is easily accessible on the University of Idaho mainframe computer. It contains hourly and daily data for precipitation, air temperature, snow courses, snowfall, streamflow, reservoir contents, peak flows and pan evaporation. In addition to data listings, numerous routine analysis programs are incorporated into NHIMS. These analyses often will be all a user needs to satisfy their requirements. The SC also maintains other databases containing airways data, solar radiation and soil frost depths.

AGRI-MET

Agri-Met data are collected by a network of automatic weather stations operated by the Bureau of Reclamation in cooperation with the Bonneville Power Administration and other local, state and federal entities. These are 15-minute, one-hour and daily data collected at about 30 stations in the Pacific Northwest for the purpose of energy conservation with an emphasis on irrigation management. All data are available through the NHIMS system. This is one of the few easily available sources of wind data for the region.

SNOTEL

The State Climatologist also has access to the Soil Conservation Service's Centralized Forecast System database, which contains extensive files useful in water supply forecasting. These include comprehensive daily temperature and precipitation data from many NWS stations in the western United States, as well as United States Geological Survey (USGS) streamflow and reservoir data. The majority of the data available from this system is the Snow Survey data. These data consist of snow water equivalent and precipitation from both SNOTEL sites and manual snow courses.

Jan, 1 Xerox Copies To: Jim & Holly, Ed Kruse, Ron Rothwacht

CAMPBELL SCIENTIFIC, INC.

P.O. Box 551 • Logan, Utah 84321 • (801) 753-2342 • TLX 453058 • FAX (801) 752-3268

August 1, 1989

TO: SM192/SM716 Storage Module Users

RE: Potential Data Loss in Storage Modules
Serial Numbers: SM192 SN 2650 and lower
SM716 SN 1385 and lower

Campbell Scientific recently became aware of two potential problems with the SM192 and SM716 Storage Modules (SM).

The first problem is related to the construction of the lithium battery which provides backup power to the data storage memory (RAM). A spring mechanism maintaining internal contact with one of the battery electrodes may stick and fail to maintain contact. Power to the RAM is interrupted and data is lost. The failure appears to occur in less than 6 months if it occurs at all. The brand of lithium battery currently used in SM's does not have a spring.

The second problem is associated with high shock environments. A sharp impact to the Storage Module may flex the PC boards inward enough to short against the metal plate (RF shield) separating the CPU and memory card. Power is interrupted and data is lost. Current SM's use spacers to block contact between the circuit cards and the RF shield.

Failures due to these problems are rare; 8 units of 2000. Many units have been in use since early 1987. CSI **only** recommends the return of a Storage Module if one of the following conditions exist:

1. Loaded battery test results in 0
2. Unexplained loss of data
3. SM shock is common in the application

CSI will upgrade the battery and card spacers at no charge on Storage Modules returned by December 1, 1989.

Contact Shanna Cowley at 801-753-2342 for return authorization and an RMA number.

Sincerely,

Dennis J Anderson

Dennis Andersen
Sales and Customer Service Manager

REVIEW DRAFT 1
by John C. Hendee
7/28/88

PROSPECTUS FOR A UNIVERSITY OF IDAHO GRADUATE PROGRAM IN ENVIRONMENTAL SCIENCE

with

Idaho National Engineering Laboratory
and Cooperating Institutions

This document provides an overview for a University of Idaho Graduate Program in Environmental Science (GPES), operated principally at the UI Moscow and Idaho Falls campuses in cooperation with the Idaho National Engineering Laboratory, but open to participants from cooperating institutions including other Idaho state universities. The objective is to train graduate students for careers dealing with the increasingly technical environmental problems of the future including the development and application of methods to predict, monitor and mitigate environmental impacts.

Potential problems for initial focus are: environmental monitoring evidence of atmospheric pollution and climate change, and associated response of plant and animal communities; determinants of forest ecosystem structure and function, biological control as a potential replacement for pesticides, reducing impacts of agricultural runoff and timber harvest on aquatic resources, hazardous waste disposal; ground water pollution; ecotoxicology; etc.

Training and research toward solving these serious and highly technical problems will result in very significant economic benefits for Idaho by facilitating industrial development combined with environmental protection. The emphases will be on training students to be pro active rather than reactive

problem solvers and establishing very rigorous long term environmental monitoring programs.

Proposed Parameters of the Program:

Organization:

1. Participating colleges are anticipated to include College of Forestry, Wildlife and Range Sciences (FWR); College of Mining and Earth Resources (COMER); College of Letters and Science (L&S); College of Agriculture; College of Engineering; and pertinent faculty from Idaho State University.

2. The graduate program in environmental science will be guided by a board of deans from the principal participating colleges, with the addition of the Director of Science Programs from INEL, Dr. Dennis Kaiser, and Director of the UI-Idaho Falls Center, Dr. Fred Tenney. The College of Forestry, Wildlife and Range Sciences will be the lead College and its Dean, John Hendee, will be leader of the Board of Deans for the program. The University of Idaho Center at Idaho Falls will administer many elements of the program, and this experience will be represented on the Board of Deans by the Center Director, Dr. Fred Tenney.

3. The GPES will be co-directed by Dr. Edward O. (Oz) Garton, Professor of Wildlife, and Dr. Bruce Wiersma, Director of the INEL Center for Environmental Monitoring and Assessment, who is also an affiliate faculty member in the College of Forestry, Wildlife and Range Sciences.

4. Faculty in the GPES will be full members of the graduate faculty at the University of Idaho, affiliate UI faculty at INEL, and graduate faculty at cooperating institutions. Adjunct faculty may be included from among cooperators including agency personnel holding university appointments such as in the U.S. Fish and Wildlife Service Cooperative Research Unit in FWR, National Park Service Cooperative Research Unit in FWR, U.S. Geological Survey in COMER; and so forth.

Curriculum & Degrees:

5. Curriculum in the GPES will consist initially of selected existing courses at UI Moscow and Idaho Falls; and approved courses at ISU. The curriculum will be supplemented by new courses to be developed specifically for the program by the GPES. The curriculum will include courses projected from Moscow to INEL over the new UI satellite uplink and vice versa, and will also include evening classes being taught at INEL.

6. A new degree in Environmental Science is anticipated following development and approval of the proposed curriculum. In the interim graduate students will be enrolled toward existing graduate degrees in the participating colleges.

7. Students in the GPES would pursue individual interdisciplinary programs of study tailored to their interests and abilities. The study programs will be determined by the students' research interests, campus location and

advice from their graduate committee. The topic for graduate research will determine the primary location of graduate study, e.g., Moscow, INEL or other location.

Funding for Faculty & Graduate Students:

8. Department of Energy (DOE) will provide one FTE faculty position, about $70,000) divided into one, half-time FTE stipend for the program co-director and one quarter-time stipends for two participating faculty members working on GPES initiatives. The faculty funding is anticipated at a level of $70,000 to cover all faculty salary and fringe benefits plus providing some travel and operating money for faculty involved in the program.

9. DOE will provide five, two-year graduate fellowships of $12,000 each for the first year of the program, and an additional five fellowships during each of the next two years so that by the end of three years there will be fifteen graduate fellowships in place at $12,000 each. The fellowships will be awarded competitively by the faculty co-directors based on scholastic ability and research interests, with one objective being to achieve a balanced environmental science program. Competition for the fellowships will be open to all the UI colleges and other state universities. Both M.S. and Ph.D. graduate students are eligible with funding anticipated as two years for master's degrees and three years of funding for Ph.D. students.

Emphasis:

10. An initial focus of the program will be Environmental Monitoring and Assessment, and the total atmospheric-ecosystem monitoring and assessment effort being developed at the Taylor Ranch Wilderness Field Station by INEL and the University of Idaho Wilderness Research Center. Other initial emphases could include projecting the impact of climate change on forest, rangeland and agricultural ecosystems of Idaho developing biological control approaches to pest and weed management, etc.

Timing:

Initial funding for development of the GPES will be in an allocation of $30,000 from INEL to the UI-College of FWR--an amount sufficient to fund co-director Dr. Oz Garton one-half time during the remaining FY89 fiscal year and necessary travel expenses to work with co-director, Dr. Bruce Wiersma and to develop a full program proposal. The goal will be to have a proposal approved by the Board of Deans and the UI President for submission to the Board of Regents before the end of the current fiscal year and in time to implement the program full scale by Fall, 1989.

File

Where Tradition Meets the Future
1889-1989
University of Idaho

July 28, 1988

Office of the Dean

College of Forestry,
Wildlife and Range Sciences
University of Idaho
Moscow, Idaho
83843 U.S.A.

208-885-6441

TEACHING
RESEARCH
SERVICE

Dr. Dennis Keiser
Manager of Science and Technology
Idaho National Engineering Laboratory
EG&G
P.O. Box 1625
Idaho Falls, Id 83415-2214

Dear Dennis:

I really enjoyed spending time with you and Bruce at Taylor Ranch. The experience really opened our minds and I am excited about the proposal we developed.

Enclosed is the draft prospectus we conceived for a University of Idaho Graduate Program in Environmental Science (GPES). As we discussed, I'm sending the prospectus to you and Bruce Wiersma for additional review and comment. The prospectus incorporates comments by Oz Garton, Mike Scott, and Dr. Ernie Ables, Head of our Department of Fish and Wildlife Resources. I also discussed the concept with Vice President Tom Bell and he asked to be kept informed of our progress. I will be circulating all our documentation to Tom to keep him abreast of our discussions.

I understand our plan to be as follows: You and Bruce will review the draft prospectus and comment either in writing or by telephone to me. When the two of us are happy with the draft framework, I will discuss it with Dean Bob Bartlett to see if COMER is interested and to get his suggestions. When you come to Moscow the last weekend in August, the three of us will meet to discuss a final draft of the prospectus. Once we are agreed on the framework we will need to meet with Vice President Bell to confirm the direction and financial arrangements. At that point, we will need to have the faculty co-directors begin working on specifics such as curricula and programs.

The concept is exciting, Dennis. But considering how busy we all are and the opportunity costs of energy invested in any one thing by our faculty, I hope we can move to a "go" or "no go" point.

I look forward to hearing from you.

Sincerely,

John C. Hendee

John C. Hendee
Dean

enclosure

cc: Dr. Ernie Ables, Head, Department of Fish and Wildlife Resources
Dr. Oz Garton, Acting Director, Wilderness Research Institute
Dr. Mike Scott, Leader, Idaho Cooperative Fish and Wildlife Research Unit
Dr. Bruce Wiersma, Manager, Environmental and Earth Sciences, INEL
Dr. Thomas Bell, Vice President, Academic Affairs

Where Tradition Meets the Future
1889-1989
University of Idaho

MEMORANDUM

Office of the Dean

College of Forestry,
Wildlife and Range Sciences
University of Idaho
Moscow, Idaho
83843 U.S.A.

208-885-6441

TEACHING
RESEARCH
SERVICE

June 12, 1989

To: Jim Fazio, Wildland Recreation Management Department

From: John C. Hendee, Dean

Subject: Soviet Visit to Taylor Ranch

The meeting with the Soviets at Taylor Ranch on May 30-31 was all I had hoped it would be. Karl Stoszek charmed them and Howard Quigley and Greg Hayward impressed them. Jim and Holly did their usual outstanding job of hosting everyone and providing orientation to the ecology and management of the surrounding wilderness and Taylor Ranch operations.

I'm requesting that Dick Bottger transfer $26 per person for myself, Karl Stoszek, Howard Quigley, Greg Hayward and Debbie Moors ($15.00 per day for 1 1/3 days plus $6.00 each for one night's lodging.) I believe that all the other guests, including the Soviets, the interpreter, and the Forest Service, Park Service and INEL scientists plus Forest Supervisor Sonny LaSalle all paid cash directly to Jim and Holly.

Thank you for your help, Jim, in arranging a very successful trip that has the potential of leading to important international cooperation and development of wilderness research at Taylor Ranch.

cc: Karl Stoszek
Oz Garton
Dick Bottger
Jim + Holly

Akendon
Hender

US/USSR SCIENTIST INTERCHANGE

AT TAYLOR RANCH WILDERNESS RESEARCH STATION

May 30, 1989

The following is a summary of a demonstration of ecological monitoring methods demonstrated and discussed at the Taylor Ranch Wilderness Research Center on 30 May 1989. Included in the summary is Dr. Yuri Puzachenko's presentation of a protocol he uses in environmental preserves in the Soviet Union and responses to that presentation by the biologists present.

The group decided that their primary task was the intercalibration of methods for ecological monitoring and assessment. This intercalibration will be achieved through examination of each other's methodology and adoption of the strongest aspects of each. Peer review from scientists outside the working group will further the objective of developing the best possible mix of measurement techniques.

FIELD METHODS

The method demonstrated by Dr. Puzachenko is designed to use a series of transects run across a range of vegetations to assess changes in biological diversity through time. A main transect is placed up a drainage with sub-transects run contour to the slope, off this primary transect. Primary and secondary transects follow set compass bearings determined subjectively to sample a particular drainage basin. Along the transects, sample points are

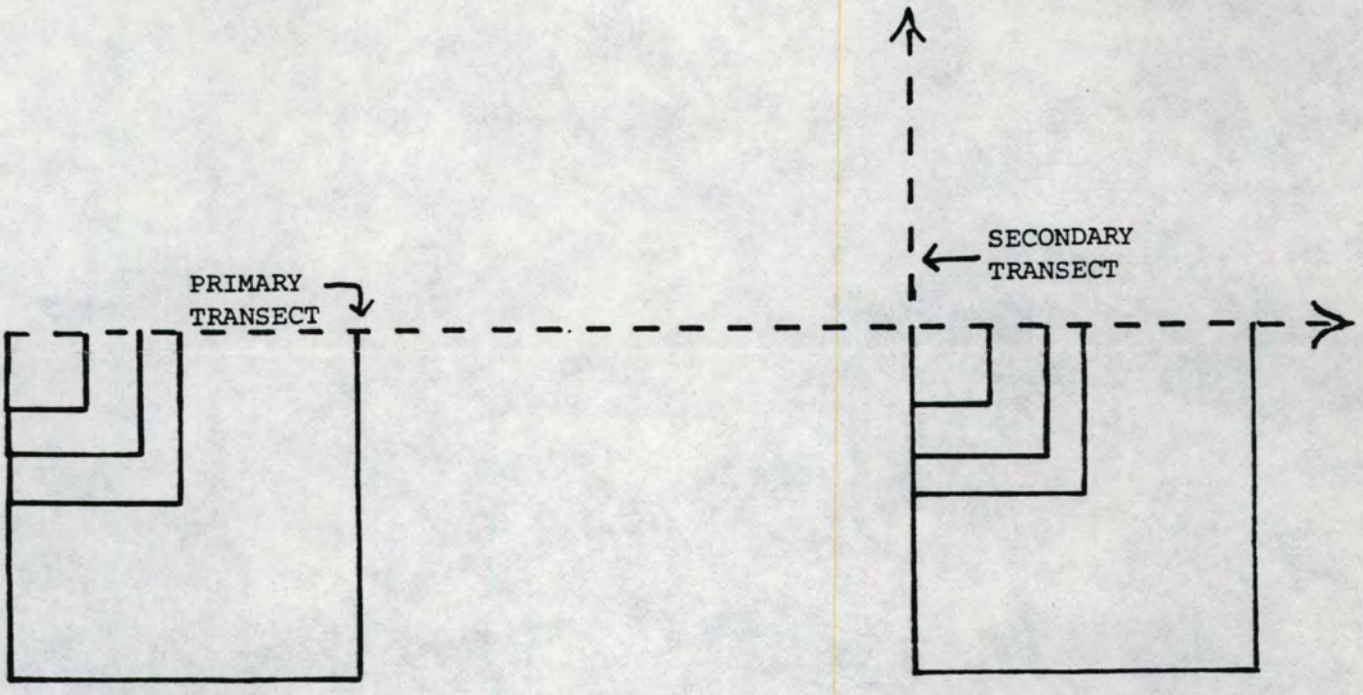
established. The distance between sample points is determined by the diversity of habitats (i.e., sample points are placed more closely in diverse habitats). Distances between samples appear to range from 12-50m; sample points are placed 25m apart on sites with modest diversity. Disturbed sites are not avoided; however, the disturbance is noted and accounted for during analysis.

At each sample point a series of nested plots sample vegetation from small to large life forms. On the $1m^2$ plot, herbs, grasses, woody plants and litter are measured. Characteristics measured depend on the intensity of sampling. At a minimum, presence/absence of all species is noted. Canopy cover and stem density are recorded in more intensive sampling. Larger plants are measured in successively larger sample plots. For instance, in $1m^2$ plots all species are recorded with their stem density (or cover). In larger plots (2.5, 5, $20m^2$) successively larger plants are measured.

Soil characteristics are measured using 5 cores taken within the $1m^2$ plot. Physical and chemical characteristics of each horizon are measured in the laboratory. Insects are sampled using sweep sampling and cores of soil litter and lower soil layers.

Small mammal traps (live or kill traps) are set at 5m intervals. Animal signs (i.e., tracks, scat, rodent tunnels) are noted at a pre-determined distance on either side of the transect. For birds, all species heard or seen from a plot during a 5-minute period are recorded. Distance to each individual heard or seen is recorded for later analysis.

At each sampling point, standard physiographic measurements are recorded (i.e., slope, aspect, exposure).



SAMPLE PLOT RESULTS

$1m^2$:

spp.#1 (Coliinsia grandiflora) - 82 stems

spp.#2 (Unbelliferae) - large cluster:1 medium cluster:1
small cluster:1

spp.#3 -

spp.#4 (Bromos tectorum) - 2 stems

spp.#5 (Galium spp.) - 7 stems

spp.#6 (Epilobium spp.) - 2 stems

spp.#7 (Symphoricarpos) - 4 stems

$2.5m^2$

spp.#2 - large cluster:1 small cluster:2

spp.#8 (Epilobium spp.): 6 stems

GENERAL DISCUSSION/COMMENTS

* Sample vegetation when cover is at the annual maximum. This will not catch ephemeral species, thus sub-samples may be required throughout the growing season.

* Within a set of nested plots, small plants are sampled in the smaller plots. How can field crews consistently identify what is a "big" plant and what is a "small" plant? Currently, plant size is determined subjectively by the investigator. Concern was voiced that a standard height (10 cm, 20 cm) needs to be established.

* What about herbaceous versus woody plant size discrimination? In some circumstances, tree seedlings less than 10cm tall are counted in the herbaceous cover plot; trees larger than 10cm tall are counted as woody cover because they are potential canopy members.

  Yuri indicated that he wanted each seedling aged for demographic analysis. This would require destructive sampling. As an alternative, the number of nodes can be used as a non-destructive index of tree age.

* In addition to measuring trees within fixed plots, Yuri measures all trees close enough to "influence" the sample point.

* During winter, transects are run to measure depth of snow and all animal tracks.

* Large mammals will be sampled separately.

LIST OF PARTICIPANTS

Yuri G. Puzachenko

Vadim Skulkin

John C. Hendee

Dale Bruns

David Graber

Leslie Viereck

Karl Stoszek

Howard Quigley

Greg Hayward

BC: Jim & Holly

Where Tradition Meets the Future
1889-1989
University of Idaho

June 6, 1989

Office of the Dean

College of Forestry,
Wildlife and Range Sciences
University of Idaho
Moscow, Idaho
83843 U.S.A.

208-885-6441

TEACHING
RESEARCH
SERVICE

To: FWR Executive Council

From: John C. Hendee, Dean

Subject: Visit by Soviet Scientists to Taylor Ranch Wilderness Field Station May 29-31, 1989

A group of Soviet and American scientists met for discussions at Taylor Ranch Wilderness Field Station May 29-31. Members of the party were:

Dr. Yuri G. Puzachenko, Institute of Animal Evolutional Morphology and Ecology, USSR Academy of Sciences; Dr. Vladimir Skulkin, Senior Scientist, Institute of Animal Evolutional Morphology and Ecology, USSR Academy of Sciences; Cary Clark, interpreter and graduate student at Colorado State University; Dr. Dale Bruns, Aquatic Ecologist, Idaho National Engineering Laboratory; Dr. David Graber, Research Scientist, Sequoia and Kings County National Parks; Dr. Les Vierck, U.S. Forest Service, Northern Forest Research Laboratory, Fairbanks, Alaska; Mr. Veto (Sonny) LaSalle, Supervisor, Payette National Forest;

From the University of Idaho: Dr. John Hendee, Dean, College of Forestry, Wildlife and Range Sciences; Dr. Karl Stoszek, Professor of Forest Resources; Dr. Howard Quigly, Research Associate, Wildlife Research Institute; Mr. Greg Hayward, doctoral candidate in wildlife; Ms. Debbie Morris, Idaho the University magazine. Holly and Jim Akinson, resident managers of Taylor Ranch, hosted the group in their usual excellent fashion.

Dr. Puzachenko and Dr. Skulkin were members of a party of seven Soviet scientists hosted by the U.S. Forest Service and the National Park Service under the auspices of the Man and Biosphere (MAB) program. The rest of the party was visiting another environmental monitoring site in the Wind River Mountains near Pine Dale, Wyoming. The Soviets were interested in the Taylor Ranch Wilderness Field Station as a potential U.S. baseline environmental monitoring station because it is located in the largest wilderness area in the contiguous United States, and is the site of previous scientific research.

The time at Taylor Ranch was spent in extended discussions, much of it in the field, about the appropriateness of field measurement techniques and overall design for field data collection to support environmental monitoring and assessment. Much of the discussion focused on the ecological transect measurement methods developed by Dr. Puzachenko and differences in philosophy and field methods between the methods developed by him and his Soviet colleagues and procedures employed by U.S. scientists. Howard Quigly and Greg Hayward took notes describing the methodology as well as could be interpreted. These notes are available for review. Mr. Sonny LaSalle explained wilderness management by the Forest Service in the overall context of forest planning. His presentation then led to an extended discussion of forest management philosophy and methods.

In addition to intense discussions about scientific methods and philosophy, FWR representatives explained our cooperative efforts with the Forest Service and the Idaho National Engineering Laboratory. Among the efforts discussed was the plan to expand Taylor Ranch facilities by relocating a building from Cabin Creek. Also discussed were a proposal for designating a central Idaho biosphere reserve to make this pristine area part of the UNESCO Man and Biosphere program, the location of the proposed Rush Creek air quality measurement station and research by UI scientists in the surrounding wilderness. There was agreement that comparison, and ultimately the intercalibration of field measurement methods, was a major challenge that should be an early focus of cooperation. We could learn from each other in comparing results if we had comparable data from the same sites using our respective methodologies.

A very general protocol was signed by Dean Hendee and the two Soviet scientists expressing our desire to cooperate in the exchange of faculty, scientific personnel and students for advance of ecological monitoring methods for assessment of global environmental change. We discussed the value of a potential cooperative project in which Dr. Puzachenko and Dr. Skulkin would participate in a U.S. workshop on ecological monitoring methods, with one of their doctoral students who could then implement field measurements at Taylor Ranch as an intern. This would yield baseline environmental measurements of a pristine site in the U.S. using Soviet methodology in a location where cooperative measurements could be taken using conventional U.S. methods. Dr. Quigly proposed a study to assess populations of Siberian tigers using electronic tracking methods which was well received by the Soviets. The Soviets indicated that in any exchange they would like to pay for transportation of Soviet scientists or students to the U.S. with Idaho picking up in-country expenses, and vice versa for U.S. scientists and students visiting Russia. The support they offered for U.S. scientists in Russia would be 11 rubles a day for professors and 7.5 rubles per day for students. It was suggested that food would cost 3.5 rubles per day, accommodations would be provided and medical care was free. The exchange rate is about $.60 per ruble. Some comparative costs were explained as a kilogram of bread .15 R, meat 2 R/kg, cheese 3.50 R/kg, milk .35 R/l, beer .30 R/l, vodka 10 R/l.

Upon conclusion of the visit the University of Idaho team expressed their consensus that: we had participated in a very meaningful encounter with some highly motivated scientists from the Soviet Union; the Soviets were very interested in cooperating with FWR; and that additional cooperation should be pursued. FWR has been invited to send a member on the MAB delegation to the USSR in August 1989 with Forest Service and Park Service scientists.

cc: Karl Stoszek
Howard Quigly
Greg Hayward
Debbie Morris
Oz Garton
Dale Bruns

Where Tradition Meets the Future
1889-1989
University of Idaho

April 12, 1989

Office of the Dean

College of Forestry,
Wildlife and Range Sciences
University of Idaho
Moscow, Idaho
83843 U.S.A.

208-885-6441

TEACHING
RESEARCH
SERVICE

Dr. Leon Neuenschwander
Associate Dean for Research and International Programs

Jim Fazio
Executive Coordinator, Wilderness Research Center

Jim and Holly Akenson, Resident Managers, Taylor Ranch Wilderness Field Station

Enclosed is information about a joint research proposal by INEL, Forest Service Intermountain Forest and Range Experiment Station and FWR for environmental monitoring and assessment in the intermountain region. Our program share is meager at this time, calling only for establishment of a global climate monitoring station at Taylor Ranch. I have been discussing our potential role with INEL (Bruce Wiersma), the Forest Service (Larry Larsen) and our congressional delegation toward expanded participation in the program development and inclusion of research natural areas on the experimental forest along with all of the other RNA's mentioned in the proposal. Everything is very tentative at this time but if we can increase our participation, this proposal may be an opportunity to strengthen the environmental monitoring and assessment efforts by our faculty.

Peripheral to this proposal and program is a proposed visit to the Taylor Ranch Wilderness Field Station by three Soviet forest scientists. They would be visiting about May 26-29 to see the site as a potential unit in a global climatalogical monitoring and assessment program. The Soviet delegation is part of a larger group of seven Soviet scientists being hosted by INEL and they will be accompanied by Dale Bruns who has been coordinating cooperative efforts at Taylor Ranch between FWR and INEL. I am trying to arrange my schedule to be there with the Soviet delegation (if I cannot make it, Jim or Leon should represent me) but I also suggest we ask a faculty member with research experience in the Big Creek drainage to help host the group, i.e., Oz Garton or Jim Peek.

The week of May 8, Dr. Bruce Weirsma of INEL will come to Moscow to discuss FWR involvement in the above mentioned research program, the proposed visit to Taylor Ranch by the Soviets and the

previously proposed Graduate Program in Environmental Science. Bruce just forwarded $15,000 to Oz as a first installment on the GPES. We should finalize an agenda for the visit by Bruce in the near future.

John C. Hendee
Dean

JCH/mp

INEL

BACKGROUND

- US - MANAGERS 6 YEARS, RESEARCH ASSOCIATES
- TAYLOR RANCH LOCATION - UNIQUE, HISTORICAL USE, SIZE B.C.
- ACCESS PRIMARILY PLANE, MAIL PLANE WEEKLY, BI-WEEKLY, RADIO
- TAYLOR RANCH IS FIELD STN. OF WILDERNESS RESEARCH CENTER
- INKEEPING WITH WILDERNESS PHILOSOPHY, STOCK - MINIMAL MOTORS TEAM
- FACILITY TO ACCOMODATE 14 COMFORTABLY, + LAB & COOKHOUSE

RESEARCH

- T.R. IS PRIMARILY FOCUSED TOWARDS RESEARCH IN NAT. SETTING
- PAST PROJECTS HAVE BEEN DONE ON PREDATOR ECOLOGY, BIRD AND MAMMAL HABITAT USE, ARCHEOLOGY, BIGHORN SHEEP
- CURRENTLY WE HAVE PROJECTS GOING ON BIGHORN SHEEP, RANGE CONDITION MONITORING, SPOTTED KNAPWEED INVASION, AND ESTABLISHING AN ECOLOGICAL MONITORING PROGRAM.

* THE ATMOSHERIC MONITORING WILL AUGMENT THE ECO. MONITORING PROGRAM VERY WELL.

– HERBARIUM, SMALL MAMMAL COLLECTION ONGOING

* FANTASTIC OPPORTUNITY FOR FIRE ECOLOGY RESEARCH RIGHT FROM THE RANCH.

EDUCATION

- 3 YEARS OF SUMMER STUDENT INTERNSHIP FOR ± 3.
  - PROVIDE FIELD ASSISTANCE ON RESEARCH, HELP ON RANCH MAINTENANCE. LEARN A VARIETY OF PRACTICAL SKILLS.

FUTURE

- MORE DIVERSIFIED ECOLOGICAL MONITORING PROGRAMS

Dale B.
526-0816

Best Western
522-2910
523-2242

Dear Dale, 10/26/88

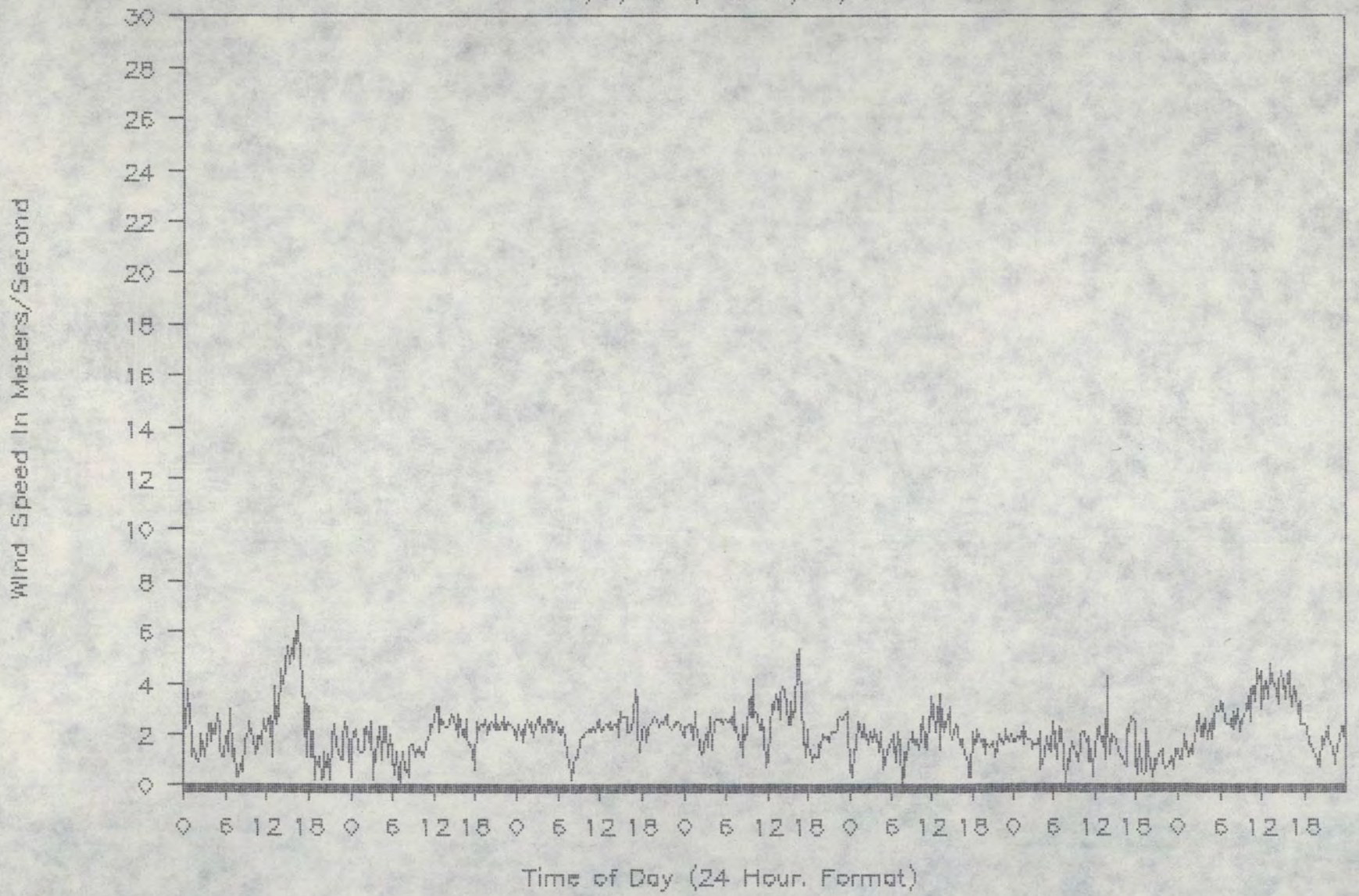
Thank you for hosting us at INEL and coordinating our visit. We felt ~~the~~ trip was very beneficial (for JNL) understanding what the joint UNI/INEL monitoring system ~~would~~ will involve in equipment & techniques ~~and~~ as well as what our role will be. We appreciated the tours of the laboratories ~~as to~~ and ~~the~~ interactions with other scientists at EG&G. ~~They~~ Both provided a broad perspective of how the T.R. program fits in with other monitoring & research efforts at INEL. We hope ~~that~~ some of the contacts we made with people at your office may lead to additional research at TR with INEL scientists. We also enjoyed meeting Tina and your girls. We look forward to getting the equip into TR & getting started on the program. ~~The field trip with was Respect~~

Tell Bruce we were glad he could go on the field trip w/ us

Sample from Lotus

Pinedale Met Station

10/9/88 up to 10/16/88



Idaho National Engineering Laboratory

August 4, 1988

Jim & Holly Akenson, Managers
Taylor Ranch Field Station
Cascade, Idaho 83611

TRIP TO TAYLOR RANCH - GBW-168-88

Dear Jim and Holly:

Thank you very much for your hospitality during my recent trip to Taylor Ranch. I was most impressed with the facilities and with the staff. I am very excited about the possibility of joint research with the University of Idaho at Taylor Ranch and can assure you of my most active involvement to ensure that these projects come to fruition.

My best to both of you. I look forward to seeing you here in September. Please consider this an invitation to have dinner with me and my family one of the evenings you are in Idaho Falls.

Best regards,

G. B. Wiersma, Ph.D.
Director
Center for Environmental
Monitoring and Assessment

dmt

cc: John Hendee, University of Idaho

Where Tradition Meets the Future
1889-1989
University of Idaho

June 14, 1988

Office of the Dean

College of Forestry,
Wildlife and Range Sciences
University of Idaho
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TEACHING
RESEARCH
SERVICE

Dr. Dennis Keiser
Dr. Bruce Wiersma
Idaho National Engineering Laboratory
EG & G
P.O. Box 1625
Idaho Falls, ID 83415

Dear Dennis and Bruce:

This letter confirms plans for the visit to the University of Idaho's Taylor Ranch-Wilderness Field Station Monday and Tuesday, July 25-26. You will need to make arrangements for an early morning charter flight from Idaho Falls or Challis on Monday, July 26, returning early Wednesday, July 27. During the summer planes can only land and take off safely at our mountainous wilderness airstrips during early morning before the heat builds up in the canyons.

Bring your field clothes, of course, sleeping bag, footwear with which you can ride horses and lightweight rain gear. If you like, bring implements for sampling aquatic life as we may have a chance. I will make arrangements for food.

I left a message for Tom Reineker to see if he can accompany us, but I'm leaving town for 7 days tomorrow so you might want to call him. Also on the trip will be Dr. Oz Garton, Acting Director of our Wilderness Research Center and hopefully, Dr. Mike Scott, leader of the Fish and Wildlife Cooperative Research Unit in the College. Dr. Ed. Krumpe, Director of the Wilderness Research Center will be in Australia as a senior Fulbright scholar.

Our agenda will be to review current facilities at the ranch, see some of the surrounding wilderness resource, and further develop the vision for the world class wilderness research and environmental monitoring facility we're working toward.

I'm looking forward to our trip. Please contact my secretary, Chris (885-6442) or Oz Garton (885-7426) for details and information if you can't reach me.

See you at the ranch.

Sincerely,

John C. Hendee
Dean

JCH:mjp

cc: Jim and Holly Akenson, Taylor Ranch Resident Co-Managers

location ?

Transect sampling - composite \ For Forested Area
H_2O, soil, Litter, mosses → MET → Air Monitor
↓ ↘ INEL

For trace metal contamination zinc, copper etc.

Interval — 2-3 months to 1 year dependant on soils and forest type canopy.

Solar charger

- cast for maximum power using shadow
- set for south
- Lead acid battery preferred
  - disconnects at 11.5 volts reconnects at 13 volts
  See status lights to see if running + listen + hour meter
  1st connect battery, 2nd solar panel & air pump
  5.25 volts non-adjustable
  air flow - 4 liters per min.
- set at 21° angle